

# SNAP TOGETHER MODULAR ELEMENTS WITH STRAIGHT CONNECTOR

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## RELATED APPLICATIONS

[0001] *This application is a Continuation In Part of U.S. Application Ser. No. 10/271,836, filed October 15, 2002 entitled "Snap Together Modular Storage", which is a Continuation In Part of U.S. Patent Application No. 09/759,898 filed January 13, 2001 entitled Snap Together Modular Storage now U.S. Patent No. 6,557,955, from which PCT application PCT/US02/00946, filed January 11, 2002 entitled "Assemble-In-Place Modular Storage" derives, each of which are hereby incorporated by this reference.*

## BACKGROUND OF THE INVENTION

[0002] *1. Field of the Invention: This present invention relates to a novel assembly device and system. More specifically, to a snap-together method and device whereby panels or other elements with interlocking latches and catches are connected.*

[0003] *2. Related Art: Modular storage systems are useful to allow a user to customize a component system to fit his or her particular needs. Panel type storage whereby similar side panels are connected via edge members are found in U.S. Pat. No. 5,638,973 issued to Dewey et. al, and U.S. Pat. No. 5,466,058 issued to Chan. In both Dewey and Chan the containers may be stacked by placing a tab-like projection on the bottom edge of one part into a groove-like indentation in the top of another.*

[0004] *U.S. Pat. No. 5,888,114 issued to Slocum et. al., teaches a toy assembly or modular storage system which has a self-supporting edge element to it. The Slocum storage system is a series of similar panels, which form cubes via a slide together extruded mating edge with a catch running down the periphery of one edge and a latch running down the other side. Once two panels are latched in the slide-together fashion, the panel edges can only be disassembled by sliding them apart. Slocum illustrates a plethora of configurations for the slide-in catch and corresponding slide-in latch, all relying on an extruded latch and catch which teaches no alignment guides or stops to*

*maintain the plumb alignment of connected panels. Slocum's slide together mating system connects 4 panels to form a four wall box.*

**[0005]** *A remaining challenge in the field of snap together elements or panels is to connect adjacent panels without intervening panels or elements. An additional challenge is to form snap together 5 or 6 sided structural elements and structures. The present invention overcomes such challenges and prior limitations by creating a snap-in latch and catch connector attachment for use with panels or other elements.*

### **INVENTION SUMMARY**

**[0006]** *The present invention is a snap together assembly device and system. Structural elements design elements and/or panels can be snapped together. In one embodiment, each panel has a front side and a back side, edges and corners. On at least one edge, viewed from a front or a back side is found a latch/catch pair. The sequence of latch to catch is alternating around each side. The sequence may also be non-alternating. The catch is elongated having adequate elasticity, memory and/or lubricity to deform and snap-back into place upon insertion or removal of the corresponding elongated latch. In some embodiments the latches are deformable and snap into a catch which may be substantially rigid or deformable.*

**[0007]** *Panels, structural elements and/or design elements snap together, at an edge, forming a substantially right angle. Additional panels and/or structural elements, design elements or other connectable elements may be added to form other structures. An alignment stop may be added to prevent sliding between a latch and a catch which may cause misalignment. At or near the corners, or near the edges on the panel or other element a buttress can be formed. Two adjacent buttresses can support each other and act as a larger support which can further stabilize the structure.*

**[0008]** *Two panels or other elements may be connected in substantially in-line orientation, without an intervening panel or other element through a straight connector. A straight connector connects latches and/or catches. The straight connector may also act as a bridge between panels or elements.*

**[0009]** *Latches and catches may be formed on one or both sides as part of each structural element, design element, or panel. Latches and/or catches may be attached*

*by slide-on, snap-on, glue mount or through mount at the appropriate locations on a structural element, design element and/or panel. Advantages to attaching the latches and/or catches, as oppose to forming as part of, include combining dissimilar materials which are impossible or difficult to co-cold. A non-exclusive list of such material include, but is not limited to, a metal frame, a wood frame, a rattan frame, a rattan grid, a wicker grid, a wicker frame, a metal sheet, cardboard, foam, fiberboard, laminate, wood or metal grid panel. Hinged doors, latching hinged doors and wheels may also be added to a cube, panel or structure. Hinges may be supported on the panel covers and closure catch to receive a closure latch, may be combined in batches and/or catches. The panels may have protruding or recessed surface features which may form a support skeleton for a grid like panel and may be used to provide pathways or guides for shelves and/or drawers. A grid frame may also support canvas, vinyl, quilted fabric, mesh, lined fabric, unlined fabric or other soft material.*

**[0010]** *Non-cube structures with rectangular side panels may also be formed. Opposing interchangeable side panels can be used to form box-like structures with a multitude of varying dimensional opposing wall repairs.*

**[0011]** *The features of the invention believed to be novel are set forth with particularity in the appended claim. The invention itself, however, both as to configuration and method of operation, and the advantages thereof, may be best understood by reference to the following descriptions taken in conjunction with the accompanying drawings.*

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0012]** *FIG. 1A is a front perspective view of a modular storage system.*

**[0013]** *FIG. 1B is a front view of an unattached corner of one panel of the embodiment shown in FIG. 1A.*

**[0014]** *FIG. 1C is a rear view of an unattached corner of one panel of the embodiment shown in FIG. 1A.*

**[0015]** *FIG. 1D is a perspective view of an attached front corner of the embodiment shown in FIG. 1A.*

- [0016] *FIG. 1E is a cut-away side view along line A-A of FIG. 1D.*
- [0017] *FIG. 2A is a front perspective view of another modular storage system.*
- [0018] *FIG. 2B is a front view of an unattached corner of one panel of the embodiment of FIG. 2A.*
- [0019] *FIG. 2C is a rear view of an unattached corner of one panel of the embodiment of FIG. 2A.*
- [0020] *FIG. 2D is a blow-up of a front corner connection of the embodiment of FIG. 2A.*
- [0021] *FIG. 2E is a cut-away side view along line A-A of FIG. 2C.*
- [0022] *FIG. 2F is a cut-away edge view of the intersection of four cubes.*
- [0023] *FIG. 3A is a front perspective view of another embodiment of a modular storage system.*
- [0024] *FIG. 3B is a blown-up back perspective view of a slide-on corner panel cover of the embodiment of FIG. 3A.*
- [0025] *FIG. 3C is a blown-up front perspective view of the slide-on corner panel cover of the embodiment of FIG. 3A.*
- [0026] *FIG. 3D is a blow-up rear perspective view of a slide-on corner panel cover of the embodiment of FIG. 3A.*
- [0027] *FIG. 3E is a blow-up of a front corner connection of the embodiment of FIG. 3A.*
- [0028] *FIG. 3F is a cut-away side view along line A-A of FIG. 3E.*
- [0029] *FIG. 4 is a perspective view of one arrangement of the connected panels.*
- [0030] *FIG. 5A is a perspective view of a second arrangement of the connected panels.*
- [0031] *FIG. 5B is a component view showing the door and attachment to FIG. 5A.*
- [0032] *FIG. 5C is a component view showing the wheel and attachment to FIG. 5A.*
- [0033] *FIG. 6 is a perspective view of a third arrangement of the connected panels.*

- [0034] *FIG. 7 is a front view of another panel embodiment.*
- [0035] *FIG. 8 is a front view of another panel embodiment.*
- [0036] *FIG. 9A is a end view of a snap-on panel cover attachment.*
- [0037] *FIG. 9B is a partial view of a panel cover snapped on to a grid panel.*
- [0038] *FIG. 9C is a cutaway view of a solid panel adapted to attach to the panel cover of FIG. 9A.*
- [0039] *FIG. 10 is a top view of another embodiment of a slide-on corner panel cover.*
- [0040] *FIG. 11A is a top view of a through mount panel cover.*
- [0041] *FIG. 11B is a perspective view of another through mount panel cover.*
- [0042] *FIG. 11C is a perspective view of another glue mount panel cover.*
- [0043] *FIG. 12A is an assembly view of an arrangement of panels.*
- [0044] *FIG. 12B is a cutaway side view of the door latch closure in the receiving latch of the embodiment in FIG. 12A.*
- [0045] *FIGS. 13A and 13B are views of a desk support formed from structural elements.*
- [0046] *FIG. 14 is a cutaway side view of a deformable latch fixed within a latch.*
- [0047] *FIG. 15 is a perspective view of another snap together structure.*
- [0048] *FIG. 16A is an assembly view of an arrangement of panels.*
- [0049] *FIG. 16B is a partial perspective view of the embodiment shown in FIG. 16A.*
- [0050] *FIG. 16C is a lot away side view along A-A of an attached straight connector.*
- [0051] *FIG. 16D is a cut away side view along A-A of two attached straight connectors.*
- [0052] *It should be appreciated that for simplicity and clarity of illustration, elements shown in the Figures have not necessarily been drawn to scale. For example, the dimensions of some of the elements are exaggerated relative to each other for clarity.*

*Further, where considered appropriate, reference numerals have been repeated among the Figures to indicate corresponding elements.*

### **PREFERRED EMBODIMENTS OF THE INVENTION**

**[0053]** *Shown in FIG. 1A is a front perspective view of a preferred embodiment, generally designated 10.*

**[0054]** *The cube is formed of five four sided panels 11. Each panel has a front 12 and a back side 13 face and an edge 14 at each side. At each end 15, of each edge 14, near the corners 16 of each panel 11, a latch/catch pair 20 is formed. Viewed from the edge 14, a latch 21 and a catch 22 are formed near the corner 16. The latch/catch pairs 20 are reversed such that on any given edge 15 of a panel 11 one latch 21 will be exposed on one side and one catch 22 will be exposed on the other side. This configuration allows alternating panels to be used to construct the entire structure.*

**[0055]** *Shown in FIGS. 1B, 1C, 1D and 1E are front and rear perspective views of a corner of an unattached panel, a perspective view of an attached front corner and a cut away view of FIG. 1D at line A-A.*

**[0056]** *In FIGS. 1B & 1C the latches 21 shape is shown, the tab projection forming the latch is elongated with an enlarged head 23 at its distal end which reversibly snaps into the corresponding elongated catch 22 slot 24 and extends at approximately a 45 degree angle from the panel. The panels are preferably an injection molded part constructed out of acrylonitrile-butadiene-styrene "ABS", Acetal, Acrylic or nylon. However, depending on the intended use, materials such as polycarbonate, polypropylene or polyurethane may be substituted. An alignment stop 30 is formed at the junction of each edge 14. The alignment stop 30 prohibits the type of movement common to latch/catch panels which are connected via an extruded latch or catch which mount together via a slide-in function. Additionally, as shown in FIG. 1D the alignment stops 30 form a buttress between panels enhancing the structural integrity of the structure.*

**[0057]** *In FIG. 1E the enlarged head 23 forming the latch is shown mated firmly within the slot 24 of the catch 22, by constructing the catch 22 out of a material with sufficient lubricity, flexibility and/or memory, the enlarged head 23 may be withdrawn or*

*snapped-out of the slot 24 by displacing the slot walls 25 which can snap-back, undamaged, upon withdrawal. A sufficiently flexible slot wall 25 also places less stress on the neck 26 of the latch 21 thereby minimizing the risk of neck damage during attachment or detachment of panels.*

**[0058]** *Referring now to FIG. 2A there is illustrated a front perspective view of a first alternate embodiment of the modular storage system, generally designated 110.*

**[0059]** *The cube is formed of five square panels 111. Each panel 111 is a square frame with an open grid structure formed therein. Each panel has a front 112 and a back side 113 face and an edge 114 at each side. At each end 115, of each edge 114, near the corners 116 of each panel 111, a latch/catch pair 200 is formed. A panel grid 117 is formed within the boundary of the edges 114 and a raised grid support 118 may be extended from the panel grid to provide greater stability to the panel grid 117 and panel 111. Viewed from the edge 114, a latch 201 and a catch 202 are formed near the corner. The latch/catch pairs 200 are reversed such that on any given edge 114 of a panel 111 one latch 201 will be exposed on one side and one catch 202 will be exposed on the other side. This configuration allows similar alternating panels, with corresponding latch/catch pairs 200 to be used to construct the entire structure.*

**[0060]** *Variations in the side panels are anticipated and discussed within. Side panels may be constructed in a wide variety of forms, with different surface features, cut-outs, skeletal structures, protrusions and the like without departing from the intended scope of the invention.*

**[0061]** *Shown in FIGS. 2B, 2C, 2D and 2E are a front and rear perspective view of a corner of an unattached panel, a perspective view of an attached front corner, a cut away view of FIG. 2D at line A-A, and a cut-away edge view of the intersection of four cubes.*

**[0062]** *In FIGS. 2B & 2C the latch 201 shape is illustrated, the tab projection forming the latch has a enlarged head 203 which snaps in a reversible fashion into the corresponding catch 202 slot 204. The panels are preferably an injection molded part constructed out of a material which is flexible and durable to provide for the snap-in and snap-out attachment such as polypropylene, ABS, polycarbonate or nylon. An alignment*

*stop 230 is formed at the junction of each edge 114. The alignment stop 230, adjacent to an angular buttress 235, prohibits forward and back movement of a latch 201 within a catch 202. Additionally, the combination of two or more adjacent buttresses 235 (FIG. 2D) forms a larger panel support further enhancing the structural integrity of the structure.*

**[0063]** *In FIG. 2D the enlarged head 203 forming the latch is shown mated firmly within the slot 204 forming the catch 202, by constructing the panels out of a material with sufficient flexibility, memory and/or lubricity the enlarged head 203 may be withdrawn or snapped-out of the slot 204 without damaging the slot walls 205 or the neck 206 of the latch 201. A support guide 250 is formed between the latch 201 and the catch 202. In FIG. 2F a support rod 260 of a size and shape to mate with the support guide 250 is shown. The support rod can be used to preclude removal of a panel when such action needs to be restricted, as may be the case with young children or in commercial, school or business locations.*

**[0064]** *FIG. 3A shows a front perspective view of a second alternate embodiment of the modular storage system, generally designated 300.*

**[0065]** *The cube is formed of five panels 301. Each panel 301 is of a similar size. Each panel side has an edge 304. At each end 305, of each edge 304, near the corners 306 of each panel 301, a slide-on corner panel cover 320 supporting latch/catch pairs 321/322 is affixed. Viewed from the edge 304, a slide-on corner panel cover 320 is attached near the corner 306. The latch/catch pairs 321/322 on the slide-on are reversed such that on any given edge 304 of a panel 301 one latch 321 will be exposed on one side and one catch 322 will be exposed on the other side. This configuration allows alternating panels to be used to construct the entire structure.*

**[0066]** *In FIGS. 3B, 3C, 3D, 3E and 3F, there is shown a front, back and rear perspective view of the slide-on corner panel cover 320, a perspective view of an attached front corner, a cut away view of FIG. 3E at line A-A, and a cut-away edge view of the intersection of four cubes.*

**[0067]** *In FIGS. 3B, 3C, and 3D the latch 321 shape is illustrated, the tab projection forming the latch is elongated and has a enlarged head 323 which snaps in a reversible*



*fashion into the corresponding catch 322 slot 324. The slide on corner covers 320 are preferably an injection molded part constructed out of a material which is flexible and durable to provide for the snap-in and snap-out attachment such as polypropylene, ABS, polycarbonate, high durometer rubber, or nylon. An alignment stop 329 is formed at the corner junction of each latch/catch pair 321/322.*

**[0068]** *FIG. 3E illustrates the position of the alignment stops 329 which inhibits movement of a latch 321 within a catch 322 thereby enhancing the structural integrity of the structure. Surrounding each buttress 330 is a support edge 331 which engages the support edge 331 of a panel affixed adjacent and forms the larger support 332 at the corner. A panel mating guide 340 is formed opposite each latch/catch pair 321/322. It is via this panel mating guide 340 that each panel 301 is fitted into the slide-on corner cover 320. It is envisioned that each panel 301 will be solidly affixed to the panel mating guide 340. The nature of the attachment will be dependent on the material the panel is constructed of, adhesives, locking tabs, sonic welds, glue, rivets, crimping and the like may be used.*

**[0069]** *Variations in the side panels are anticipated and discussed within. A non-exclusive list of possible side panel materials are framed wire mesh, coated wire, plastic grids, wood, metal, plastic, composites, sheet steel (stainless, hot or cold rolled carbon steel, or any alloy), brass, or copper stamped or formed, woven metal or plastic and metal frames inserted molded into plastic.*

**[0070]** *In FIG. 3F the enlarged head 323 forming the latch is shown mated firmly within the slot 324 forming the catch 322. By constructing the slide on corner covers 320 out of a material with sufficient lubricity the enlarged head 323 may be withdrawn or snapped-out of the slot 324 without damaging the slot walls 325 or the neck 326 of the latch 321.*

**[0071]** *Shown in FIG. 4 there is illustrated a perspective view of one arrangement of the connected panels, generally designated 400.*

**[0072]** *A series of cubes 401 are attached together with one panel 410 acting as a common panel shared between cubes 401. A latch/catch pair (as described in FIGS. 1-*

3) is found on opposite sides of each panel 410 to facilitate snap together construction of the cubes 401.

[0073] Shown in FIGS. 5A, 5B and 5C there is a perspective view of a second arrangement of the connected panels, generally designated 500 forming a vertical storage case with wheels (FIG. 5C) and a swing door (FIG. 5B).

[0074] A series of cubes 501 are attached together (as described in FIGS. 1-4) constructed out of identical panels 510 forming a tower. A shelf member 511 is held within a guide 512 formed as part of the surface feature of the panels 510.

[0075] A hinged door 520 attaches to one of the cubes 501 via a hinge which has one latch 521 and one catch 522 (as described in FIGS. 1-3). A group of removable caster-type wheel modules 530 are affixed one per bottom corner, to the tower 500. Each wheel module 530 has one wheel 531 and rod 532, which mates with a boss 533 formed in each corner of the bottom panel 510. Each rod 532 extends from a wheel stop 534 and mates with the boss 533.

[0076] Shown in FIG. 6 there is a perspective view of a third arrangement of the connected panels, generally designated 600.

[0077] A series of cubes 601 are attached together (as described in FIGS. 1-4) constructed out of panels 610 forming a tower. In the configuration the cubes 601 are of a scale for desktop use to hold pads, paper, pens, clips, computer disks, CDs or other media storage devices. A series of rubber pads 620 may be affixed to the bottom surface of the lower cube 601 to inhibit slippage on a desktop.

[0078] Shown in FIGS. 7 & 8 there are front views of a first and second alternate panel embodiments generally designated 700 & 800, respectively.

[0079] In FIG. 7 there is a metal and plastic panel which has a wire insert 701 embedded within a preferably clear or translucent plastic structure 702, within a four sided square frame 703. On opposite ends of each side of the square frame 703 a latch 704 and a catch 705 (as previously described in FIGS. 1-3) are affixed, or formed as a part thereof. On the back face (not shown) of the panel 700 opposite each latch 704 is a catch 705 and opposite each catch 705 is a latch 704.

**[0080]** *In FIG. 8 a square four-sided frame panel 801 supports a central mesh 802 affixed at opposite ends of each side of the square frame panel 801 is a latch 803 and a catch 804 (as previously described in FIGS. 1-3). On the back face (not shown) of the panel 800 opposite each latch 803 is a catch 804 and opposite each catch 804 is a latch 803. The square frame 801 and/or the mesh 802 may be constructed of plastic, metal or metal coated with a rubber-like material, lacquered, painted or metal plated.*

**[0081]** *In FIGS. 9A and 9B another panel cover 820 is shown. The latch 821 is a tab projection with an enlarged head 822 which snaps in a reversible fashion into the corresponding catch 823 slot 824. The panel cover 820 is preferably an injection molded part constructed out of a material which is flexible and durable to provide for the snap-in and snap-out attachment such as polypropylene, ABS, polycarbonate, high durometer rubber, or nylon. An alignment stop 825 is formed on the panel cover 820.*

**[0082]** *A snap-in panel mating guide 830 is formed opposite each latch/catch pair 821/823. It is via this snap-in panel mating guide 830 that a square frame panel 801, or other as shown in FIG. 9C, a solid panel 831, can be fit into the panel cover 820. The square frame panel 801 preferably has a circular section 833 for the frame of a size that can be snapped into the snap-in panel mating guide 830. A solid panel 831 can be attached to the panel cover via an attachment head 832 which is of a size that can be snapped into the snap-in panel mating guide 830.*

**[0083]** *In FIG. 10 another panel cover 835 is shown. The panel cover is a variation of the panel cover shown in FIG. 9. The latch 821 is a tab projection with an enlarged head 822 which snaps in a reversible fashion into the corresponding catch 823 slot 824. The corner cover 835 is preferably an injection molded part constructed out of a material which is flexible and durable to provide for the snap-in and snap-out attachment such as polypropylene, ABS, polycarbonate, high durometer rubber, or nylon which provides flexibility and durability. An alignment stop 825 is also formed thereon.*

**[0084]** *A slide-in panel mating guide 340 or a snap-in panel mating guide 830 can be formed opposite each latch/catch pair 821/823. The panel mating guide 340/830 is used to hold a panel into the panel.*

**[0085]** In FIG. 11A another panel cover 840 is shown. This panel cover has one latch 821 and one catch 823 and has a through-mount attachment. The latch 821 is a tab projection with an enlarged head which snaps in a reversible fashion into the slot of the corresponding catch 823. The panel cover 835 is preferably an injection molded part constructed out of a material which is flexible and durable to provide for the snap-in and snap-out attachment such as polypropylene, ABS, polycarbonate, high durometer rubber, or nylon. An alignment stop 825 is formed at the corner junction of each latch/catch pair 821/823.

**[0086]** With the mount guides 841, formed through a mounting plate 842, the panel cover 840 can be mounted to a panel (shown generally in FIG. 12A) with an attachment fastener, a non-exclusive list of fasteners which may be suitable include nails, rivets, screws, nuts and bolts, pins, swaged connectors, and barbed connectors. The corner cover 840 mounting plate 842 can also be used to form a receiving catch 843 for a latch closure. An extended lip 844 may be added to the receiving catch to provide an edge to hold a latch closure.

**[0087]** The illustration of four mount guides 841 is not a limitation or requirement. The number, size and placement of mount guides 841 is dependant on the any number of factors which include, but are not limited to, the type of panel material the panel cover 840 is to be through mounted to, whether the corner cover will also support a hinge (as shown in FIG. 12), whether the mounting plate 842 is used as a closure catch (shown in FIG. 12), or whether the mounting plate 842 is used to support a top (shown in FIG. 13).

**[0088]** In FIG. 11B another panel cover 845 is shown. This panel cover has one latch 821 and one catch 823 and has a through-mount attachment. The latch 821 is a tab projection with an enlarged head which snaps in a reversible fashion into the slot of the corresponding catch 823. The panel cover 845 is preferably an injection molded part constructed out of a material which is flexible and durable to provide for the snap-in and snap-out attachment such as polypropylene, ABS, polycarbonate, high durometer rubber, or nylon. An alignment stop 825 is formed at the corner junction of each latch/catch pair 821/823.

**[0089]** *The mount guide 841, formed through the mounting plate 846, is used to hold the mounting plate 846 within a support slot 1000 at the corner of a panel 1002. The illustration of a single mount guide 841 is not a limitation or requirement. The panel cover 845 is held within the support slot 1000 with a fastener. In this embodiment the fastener 1100 is constructed of a two piece connector 1102 and 1104 which is inserted through a fastener guide 1004 within the panel 1002. A non-exclusive list of fasteners which may be suitable include nails, rivets, screws, nuts and bolts, pins, swaged connectors, and barbed connectors.*

**[0090]** *In FIG. 11C another panel cover 847 is shown. This panel cover has one latch 821 and one catch 823 and has a through-mount attachment. The latch 821 is a tab projection with an enlarged head which snaps in a reversible fashion into the slot of the corresponding catch 823. The panel cover 847 is preferably an injection molded part constructed out of a material which is flexible and durable to provide for the snap-in and snap-out attachment such as polypropylene, ABS, polycarbonate, high durometer rubber, or nylon. An alignment stop 825 is formed at the corner junction of each latch/catch pair 821/823.*

**[0091]** *Glue mount attachment guides 848 formed through the mounting plate 849, into which glue or adhesive can flow through prior to curing, are used to adhere and/or fix the panel cover 847 to the panel 1002. The mounting plate 849 nests within the support slot 1000 at the corner of the panel 1002. The number size and shape of glue mount attachment guides 848 is not a limitation or requirement.*

**[0092]** *The panel cover 847 is held within the support guide 1000 by a glue or adhesive (not shown) added to the support guide and/or the mounting plate 849 and the glue mount attachment guides 848.*

**[0093]** *Shown in FIGS. 12A and 12B there is illustrated an assembly view and cutaway view of one arrangement of connected panels, generally designated 850.*

**[0094]** *A non-cube box is formed by connecting rectangular panels 851 via the panel covers 855 and utilizing a square panel 12 to form a hinged door 852. A pair of hinges 853 can be mounted to panel covers 840 via the through-mount guides (See FIG. 11) fastened to the hinged door 852 via fasteners 854. The panel cover 840 mounting*

*plates 842 to which the hinges 853 are mounted also provide the receiving catch 843 (shown in FIG. 11) with extended lip 844 for the latch closures 855. The latch closures 855 have one or more flexible regions 856 which deform to fit into the receiving catch 843 thereby holding the hinged door shut. FIG. 12B shows a latch closure 855 in a receiving latch 843 with the extended lip 844 holding the closure 855.*

**[0095]** *FIGS. 13A and 13B show an assembly and a perspective view of a desktop supported by an arrangement of structural elements generally designated 860.*

**[0096]** *A series of cubes 300 and panels 12 are connected together to form a structural element 861 of a selected height. A desk top 862 is supported on top of the structural element at one end and by a support leg 863 at the other end. To inhibit the top from moving, through-mount corner covers 840 are mounted to the underside of the top and positioned to correspond to the location of corresponding latch/catch pairs 821/823. Door latch closures 855 may be substituted for one more of the through mount panel covers 840 and aligned with corner covers which included a receiving 843.*

**[0097]** *In FIG. 14 there is shown a cut-away side view of a panel cover 870 with a collapsible latch 871. In this embodiment the tab projection 872 forming the latch is elongated and has an enlarged split head 873 constructed of two half heads 874 and 874'. The half heads 874 and 874' snap in a reversible fashion into the corresponding catches 875 slot walls 876. The enlarged split head 873 is deformable for entry into the catch 875. The catch slot walls 876 may be non-deformable or they may be deformable.*

**[0098]** *The latch/catch pairs 871/875 are preferably an injection molded part constructed out of a material which is flexible and durable to provide for the snap-in and snap-out attachment such as polypropylene, ABS, polycarbonate, high durometer rubber, or nylon and with sufficient lubricity so that affixed latch/catch pairs 871/875 may be snapped in (attached) and snapped out (detached) at least several times without interfering with attachment or detachment.*

**[0099]** *Shown in FIG. 15 is another snap together arrangement of panels 12. Panel covers 901 each with a latch/catch pair 902/903 supported thereon are shown affixed to panels 12.*

**[00100]** *Although the attachment is illustrated as a slide-on mount, other mounts such as snap-on or through mount may be used. Moreover, although the illustration shows panel covers 901, the latch/catch pairs 902/903 may also be formed as part of the panel.*

**[00101]** *A straight connector 1200 with a latch 1202 and a catch 1204 is shown in FIGS. 16A-16D. The straight connector connects two elements together. The straight connector acts like a bridge. The side panels 1215 (shown in FIG. 16A) are connected in-line and, in this illustration, form a substantially straight element 1217 without an intervening perpendicular panel as shown in FIG. 4. Those skilled in the art will recognize that other elements (not shown) suitable for connection via the latch/catch system may be uneven and although connectable with the straight connector 1200 such uneven elements may appear off-set yet be in-line.*

**[00102]** *FIG. 16A shows the top and bottom panels 1220 & 1230 connected to side panels 1215 to form a box structure. Shown in FIG. 16B, the straight connector 1200 forms a bridge between the two side panels 1215. For assembly, shown in FIGS. 16C and 16D, the latch 1202 of the straight connector 1200 snaps into a catch 823 on the corresponding panel cover 845 which is attached to a side panel 1215 in the manner described in reference to FIGS. 11A-11C. The latch 821 of the panel cover 845, of the other side panel 1215, snaps into the catch 1204 of the straight connector 1200.*

**[00103]** *As shown in FIG 16C a second straight connector 1200' may be added in a similar fashion to the remaining unconnected latch 821' or catch 823' on the side panels 1215.*

**[00104]** *Those skilled in the art will recognize that the alternating latches and catches are not a limitation. An edge may contain only catches or only latches and be connected through the interaction of corresponding catches to latches. A straight connector may have two latches or two catches and form a bridge between corresponding latches or catches.*

**[00105]** *Since certain changes may be made in the above apparatus without departing from the scope of the invention herein involved, it is intended that all matter*

*contained in the above description, as shown in the accompanying drawing, shall be interpreted in an illustrative, and not a limiting sense.*